

purpura hemorrhagica, and in it x-ray therapy was given extremely small mention. I think that this is evidence of the fact that the irradiation treatment of the spleen for purpuric conditions is not sufficiently well understood or appreciated. This is most likely due to the fact that the amount of irradiation given in the majority of instances is not sufficient to accomplish the results desired. If only one or two treatments are given to the spleen, there may be a temporary increase in the platelet count, and a cessation of hemorrhage; but if the treatment is not carried to a much higher level the platelets are likely to drop again and the condition recur. We have found it necessary to carry the treatments to as much as 1,200 roentgens to the spleen from at least two ports in order to make the cure more or less permanent.

I have not had the opportunity to check or repeat the work which Doctor Garland has done in connection with roentgen therapy for capillary oozing and increased coagulation time. I am extremely interested in this work, and it opens up a new field. If the preoperative irradiation of patients whose coagulation time is prolonged were established as a routine, it seems likely that the marked bleeding of these cases would be a thing of the past. From Doctor Garland's report it would seem that this would be a logical step, particularly in the case of tonsillectomy operations. I hope that this work of x-ray treatment of the spleen will receive a more widespread attention, and be given a more thorough trial in the future, so that either corroboration or disproof of the results which he has reported, and those which Doctor Mettler and I reported at an earlier time, may become established.

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JOHN C. RUDDOCK, M.D. (1930 Wilshire Boulevard, Los Angeles).—The subject of the treatment of thrombocytopenic purpura hemorrhagica is one that has been before the medical profession since 1925, at the time Pancoast, Pendergrass, and Fitzhugh published "The Status of Roentgen-Ray Treatment by Irradiation of the Spleen." Controversy between surgeons and roentgenologists has been evident as to which is the best method of treatment.

The roentgenologists certainly can say that there is a zero mortality from the treatment itself. The surgeons state that, by the complete removal of the spleen, they reduce the possibility of remissions. It is a question whether complete ablation of the spleen can be done by roentgen-ray without other effects upon the body than the purpose for which the splenectomy was done.

Cases are often encountered of thrombocytopenic purpura, with active bleeding, in which the patient is practically "bled out," and in spite of transfusions it is impossible for them to retain enough blood to build them up. X-ray therapy is slow, but I must say that it is safe at this stage. Often we must give repeated transfusions during the irradiation of the spleen, as the bleeding does not stop immediately, but may continue for a number of days before clotting and bleeding time approach normal. It is my opinion that when this has been accomplished, and by means of transfusions the blood volume has been returned to normal, that a splenectomy should be done. It is my opinion, also, that remissions, if these patients were treated by a combination of roentgen-ray and surgery, would be fewer and the surgical risks would be lessened if the patients received irradiation in order that they may be made a good risk.

The irradiation of the spleen in normal persons prior to minor surgery in order to guard against capillary oozing and postsurgical hemorrhage is excellent, and I believe it is a timely subject.

Doctor Garland should be complimented on his excellent review on the subject of this type of disease treatment, and on his calling attention to the fact that, due to the variability and severity of individual cases and variability of the nature of the roentgen therapy given, much variability will be noted in the results reported from the treatment of this disorder both by roentgenologists and surgeons.

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S. P. LUCIA, M.D. (2529 Union Street, San Francisco). Variation in the results of roentgen irradiation of the spleen in thrombocytopenic purpura hemorrhagica is a matter not only of variability in the severity of individual cases, and in some instances of inadequacy of amount of roentgen

therapy, but also of variability in the type of the disease. Thrombocytopenic purpura is usually a symptom-complex of a more complicated disease involving alterations in structure of the hematopoietic tissues and blood plasma, and in permeability of capillaries. It may be a manifestation of infections, leukemia, heavy metal therapy, or arteriosclerosis. A variety of this condition, occasionally congenital, is seen in women who suffer from endocrine glandular hypofunction. All types of purpura may or may not be associated with splenomegaly.

The purpuric state is not necessarily associated with thrombocytopenia—in fact the blood platelets may be found to be increased in numbers. Frequently it is difficult to state which factor—platelets, plasma, or capillaries—is most important in a given case. One thing is certain: that in order that purpura may occur, the capillaries must be abnormally permeable. It is indeed unfortunate that the varieties of thrombocytopenic purpura cannot always be differentiated or the mechanism of their production be understood. This, I believe, is the reason for discord in the reports of the results of treatment found in the literature.

Before the treatment of thrombocytopenic purpura hemorrhagica can be placed on a rational basis, more careful study must be made of plasma, capillaries, and platelets in individual cases. It is important also to learn the mechanism by which blood platelets are increased and the manner in which the coagulation of blood is altered after exposure to roentgen irradiation.

In conclusion, it may be stated that: (1) Acute purpura without splenomegaly is best treated by transfusion. This variety frequently proves refractive to all therapeutic measures, including roentgen irradiation and splenectomy. (2) Chronic purpura without splenomegaly (refractive to medical treatment) may react favorably to roentgen irradiation for limited periods of time. (3) Acute purpura with splenomegaly (usually secondary to some more complex disease) frequently gives a favorable response temporarily to a variety of therapeutic measures, including roentgen irradiation. (4) Chronic purpura with splenomegaly usually responds satisfactorily to roentgen irradiation.

## VITAMIN D IN ACNE\*

### A COMPARISON WITH X-RAY TREATMENT

By MERLIN T.-R. MAYNARD, M.D.

San Jose

DISCUSSION by George V. Kulchar, M.D. San Francisco; Henry J. Templeton, M.D., Oakland; Nelson Paul Anderson, M.D., Los Angeles.

THERE is probably no skin disease of greater importance to the human race than acne. It is undoubtedly our commonest skin disease, and it is rare that any individual reaches maturity without having had it in one of its phases. It is a disease of considerable economic importance, as the disfiguring scars of a severe case are never completely obliterated. It is also a disease of youth. It attains its most noxious form at the time the individual first has to earn his own living. It is undoubtedly responsible for many failures in getting business positions. It is also the basis for inferiority complexes and discouragement in young people.

The dermatologist sees only a small percentage of patients, since many patients are not treated in the expectancy of the condition being outgrown. A goodly percentage are treated over the drug counter or by the family doctor, usually with little success. In dermatological practice, acne cases are likely to rank about third in the frequency of skin diseases, and for this reason are of considerable

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importance to the specialist. The dermatologist has many weapons with which to attack the disease, as listed below.

#### OUTLINE OF ACNE THERAPY

1. Dietary.
2. Endocrine.
3. Vaccines and bacteriophage.
4. Local.
5. Physiotherapeutic.
  - a. Ultra-violet light.
  - b. X-ray.
6. Chemotherapy.
  - a. Colloidal manganese.
  - b. Saline and glucose.
  - c. Sulphids by mouth.

#### COMMENT CONCERNING THERAPEUTIC MEASURES

I hardly need call to your attention, as dermatologists, the dissatisfaction of the above treatments; but I will run over them briefly.

*Dietary treatment* alone has rarely resulted in a cure. The type of diet depends upon which school of thought we follow. If we believe in a low carbohydrate diet, our results seem about the same as when we allow a dominant amount of this factor. Undoubtedly, food sensitization does play some part, and chocolate, for example, should certainly be eliminated.

The *endocrine factor* in treatment has always appealed to the professional mind. This is natural, in view of the fact that acne is a disease of puberty and its future years only. I think we can say that no endocrine extract has been sufficiently successful to warrant a major place in our therapeutic attack. When anterior pituitary "S" fraction first came on the market, I used it experimentally on twelve cases. I gave a total of 150 injections to these patients. I undoubtedly got good results in the early adolescent type, and was able to prevent the menstrual flare-up in women. I found, however, that my cases relapsed on discontinuing the injections, and the patients were dissatisfied. There is a distinct question in my mind whether or not anterior pituitary is justifiable, except as an adjunct to other therapy.

*Vaccines and bacteriophage* have their champions, and I believe that we may yet find these procedures to be more useful than they have been in the past. At the present time, the high cost to the patient, the time lost in treatment, and their uncertain results place them still in the experimental stage. Local treatment has been used for centuries and has changed little except in the elegance of the preparation applied.

*Local treatment* is of undoubted benefit, and simple cases will commonly require nothing else. The nature of the acne process, and the barrier of the hyperkeratotic reactions of the duct, with the comedone formation, make it impossible to get sufficient penetration for any deep effect. The preparations of sulphur have always dominated this field. Chemotherapy has made some definite strides in the past few years. Colloidal manganese has given excellent results in the hands of E. L. Oliver and G. M. Crawford.<sup>1</sup> Intravenous sodium chlorid injections have been reported favorably by Goodman,<sup>2</sup> G. M. Crawford and J. H. Swartz<sup>3</sup>; like-

wise have found promise in the similar use of dextrose solution. These procedures are well worth a trial. I have personally used them too little to comment on them further.

*Physiotherapeutic procedures* have been most prominent in the last two decades. These have mainly consisted of ultra-violet light and x-ray. About ten years ago ultra-violet light began to wane in popularity. In the past few years a review of the literature shows that the firm position of x-ray has been somewhat undermined. A decade ago x-ray was used almost without question on all patients. We found it of much value. We were able to produce cures and excellent cosmetic results. We were successful in severe cases that were doomed to lifelong disfigurement, unless the process was quickly stopped. X-ray still dominates the field in severe cases. It has been my experience, and I am sure the experience of all of you, that too high a percentage of cases will relapse after x-ray therapy, if that alone is used in treatment. I do not deny that we can get more cures with x-ray than with any other procedure. But the reasons for failure, and the reasons for relapse, have been behind the development of the study here presented. I might say that a further disadvantage to x-ray is that its competent use is only sparsely available to the patient. There is a great hinterland of the country where skilled roentgen therapy is unheard of, and the acne sufferers must depend upon the advice of the general practitioner for care. I, therefore, believe it is the responsibility of the dermatologists to place in the hands of these practitioners the type of treatment that will halt or modify the ravishes of disfiguring acne. I should not neglect to say, however, that x-ray therapy, properly used, will not produce damage to the patient. Ultra-violet light therapy has been discouraging, because it does not prevent recurrences of the disease, and requires numerous and expensive visits to the doctor's office.

In the foregoing part of this paper an attempt has been made to point out forms of treatment that have a definite value. I would say that, as a general rule, the disadvantages are those of requiring frequent treatment, expense of administration, and lack of general constructive effect.

#### VIOSTEROL IN ACNE

The patient commonly asks the doctor if he "shouldn't have something for his blood." We also feel that the patient should be put in the best possible health. The missing elements, or the excess thereof, that cause acne to develop in the adolescent, should receive every intelligent consideration. It was in response to this need that, in 1933, I started, in acne cases, giving viosterol by mouth. This was stimulated later by the results of A. Doktorsky and S. S. Platt.<sup>4</sup> I read an abstract of this paper in January, 1934, in the Year Book of Dermatology. I then began to use vitamin D in all cases, and have continued it up to the present time. The use of vitamin D seemed to fit in where needed. It improved the patients' general nutrition; many of them put on weight, and the majority of them felt much better. Its use

seemed rational. Vitamin D is synthesized in the skin on exposure to sunlight. Might not this be the factor that caused healing on ultra-violet therapy? Vitamin D is a mobilizer of calcium. It is probably withdrawn from its reservoir in the skin at puberty for the purpose of the utilization of calcium in growth of bone and muscle. Vitamin D has the further advantage of reasonable cost.

The subject of vitamin effects in the body is so large that I will not attempt to make a prolonged dissertation on the subject. The Council of Pharmacy and Chemistry state that the following are allowable claims in relation to vitamin D:

Animal experimentation has shown that correction of an inadequate dosage of vitamin D results in the more economical utilization of calcium and phosphorus, and also that the undesirable effects of improper ratios of calcium and phosphorus in the diet can largely be overcome by normal intake of vitamin D. . . . It may be stated that vitamin D has a favorable influence on calcium and phosphorus metabolism.

#### DANGERS OF VITAMIN D ADMINISTRATION

Dr. C. D. Leake<sup>5</sup> has pointed out that certain dangers exist in the unregulated intake of vitamin D preparations. He states that these symptoms are largely due to the substance "toxisterol," and that this preparation should be carefully guarded against in the manufacturing of the product. The symptoms brought on by vitamin D toxicity appear about two weeks after the high daily dosage begins. The patient is nauseated, dizzy, and has tingling in the extremities. There may also be vomiting, diarrhea, and polyuria. Mild symptoms of toxicity occurred twice in my series of cases.

In regard to dosage of vitamin D, we probably have considerable latitude. The statement is made that 200 drops a day may be given with safety to juveniles. The Council on Pharmacy and Chemistry of the American Medical Association suggests a maximum daily dose of 1,000 units in lay advertising. Larger doses, of course, may be given under the supervision of a physician. C. I. Read of Chicago, in a study made of the administration of highly concentrated vitamins of 10,000 X gave to three hundred patients, ranging from seven to seventy-two years of age, doses of from 3,000 to 2,760,000 international units daily, or a maximum of 920 times the normal antirachitic dose of 3,000 international units. This group of forty-three patients showed symptoms of toxicity of varying degrees.

#### GENERAL PHYSICAL EFFECTS

The general physical effects of viosterol administration are those of increase of appetite, improved food absorption, gain in weight, and a general sense of well-being.

The reaction of the patients on the mental side has been helpful. Their improvement in appetite, and often a lessening of fatigue, have been factors of value in getting coöperation in treatment. In no instance, except in the above-mentioned cases of intolerance, have I had a patient dissatisfied with this form of treatment. From the standpoint of the physician it effectively answers the old ques-

tion, "What can we do to improve the patient's general health?"

#### DISCUSSION

Before going forward with the discussion of my survey I wish to state that I cannot claim that viosterol is more effective, if given alone, than it might be when incorporated with the other recognized vitamins. It is quite possible that the addition of vitamin A would be of value, and it is my intention to make a further survey of cases in which this has been done. Up to the present time, however, I do not believe that the addition of vitamin A helps the patient's response, and it does definitely increase the expense. It is also likely that vitamin D is not the most effective of this group, and only a future series will make possible a comparison.

I consider the following cases to be fair illustrations in this series.

#### REPORT OF CASES

CASE 1.—December 5, 1936. R. W., age thirteen. Adolescent acne comedone. Sister, age thirty, has acne. Number of deep lesions present. Given lotio alba cream and viosterol, twenty drops each morning.

January 9, 1937. Appetite fine. Skin dry and much better; deeper lesions absorbing.

February 13, 1937. Pimples stopped; blackheads dry. To apply hot compresses to remove. This patient is illustrative of a normal response.

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CASE 2.—June 17, 1935. Miss B. H., age nineteen. Acne two years. Feels tired; menses normal; bowels somewhat constipated. Acne of deep cystic type in chin area. Viosterol, twenty drops daily, prescribed.

July 9, 1935. Weight 119, gained three pounds; appetite better; still tired; acne distinctly better.

August 6, 1935. Better.

September 3, 1935. Weight 117 pounds. Almost healed.

January 31, 1936. No longer tired; feels fine. A few new lesions around Christmas time. Entirely satisfactory.

This patient gives evidence of general favorable effect.

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CASE 3.—February 18, 1935. J. D., age seventeen. Severe acne two years. Lesions deep with marked induration. X-ray considered advisable. Given viosterol, twenty drops daily.

March 4, 1935. Distinctly better. Unable to afford x-ray.

March 22, 1935. Letter stating, "Getting along fine. Face much better."

April 9, 1935. Letter stating, "Feels much better, and face looks 100 per cent better."

This patient gives verbal evidence of enthusiasm.

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CASE 4.—March 16, 1934. C. D. Severe acne vulgaris of the face for three years. Past history was negative. Mother had acne. X-ray considered advisable. Given lotio alba cream and viosterol, twenty drops daily.

April 27, 1934. Much better.

June 25, 1934. Better; a few pustules with last menses; appetite better; has gained weight.

June 8, 1935. Has been much better, but recently has relapsed moderately. X-ray advised. Given x-ray, sixteen treatments, with complete healing.

This patient demonstrates improvement with partial relapse, but also a slow response to x-ray treatment. This patient would be a slow result with either treatment. The response to viosterol is favorable, however.

CASE 5.—August 13, 1934. A. C., age 21. Acne, moderately, four years. Has had one and one-half years of x-ray treatment by dermatologist elsewhere. Healing unsatisfactory. Menses irregular, and is constipated, high-strung, and nervous. Was given viosterol, twenty drops daily.

September 14, 1934. Better.

October 13, 1934. Doing well.

November 10, 1934. Healed.

The above case demonstrates healing with viosterol after failure with x-ray.

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CASE 6.—August 3, 1935. M. R., age twenty. Severe acne, with scarring, for six years. Had fifteen x-ray treatments by dermatologist elsewhere without healing. Given viosterol, twenty drops daily.

September 30, 1935. Much better. Gained five pounds. May 25, 1936. Having no lesions. Taking forty drops of viosterol daily.

September 28, 1936. Still healed.

Illustrative of healing after x-ray failure.

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CASE 7.—June 16, 1936. R. K., age twenty-six. Acne since age fourteen; cystic type. Given viosterol, forty drops daily. On July 10, reduced to thirty drops.

September 18, 1936. Gained six pounds. Has more vigor, larger appetite, sleeps better. Practically healed.

The above patient demonstrates an undoubted response.

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CASE 8.—November 28, 1936. M. W., age twenty-one, male. Cystic abscesses back of the neck. Given viosterol, twenty drops daily. Advised that x-ray probably would be necessary.

December 11, 1936. Appetite much better. Lesions absorbing. Takes twenty drops daily.

January 8, 1937. Much better, absorbing.

March 5, 1937. All lesions healed.

The above patient demonstrates an exceptional result from what is commonly a resistant form.

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CASE 9.—February 29, 1936. F. F., age seventeen. Severe acne for four years on face and back; has considerable scarring. Tires easily, otherwise in good health. Given viosterol, forty drops daily; also iron.

April 18, 1936. Some flare-up with menses.

May 23, 1936. Feels a lot better generally; about 80 per cent improvement.

July 18, 1936. Relapsing. Is living in very hot climate. X-ray advised, and was given thirteen treatments. Healed.

March 4, 1937. Moderate recurrence.

The above patient demonstrates healing followed by relapse on change of climate in spite of excessive sunlight, healing with x-ray, with subsequent partial relapse.

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CASE 10.—October 27, 1935. N. D. M., age twenty-four. Deep cystic acne on face of several years' duration. Given viosterol, twenty drops daily; also hydrochloric acid.

November 19, 1935. Two pustules only. Viosterol increased to forty drops daily.

February 18, 1936. Splendid result. Complete healing.

November 2, 1936. Did not take viosterol during summer and has relapsed. The patient requests x-ray treatments. X-ray was given; twelve treatments, with complete healing.

The above patient demonstrates complete healing with viosterol, with subsequent relapse, followed by healing on a normal amount of x-ray treatment.

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CASE 11.—August 17, 1936. A. C., age twenty-one. Acne for five years; deep pustular type. Given viosterol, forty drops daily.

October 17, 1936. Viosterol reduced to twenty drops. About the same.

November 24, 1936. Acne completely healed. Skin oily.

February 11, 1937. Still healed.

The above patient demonstrates the healing of acne without influence on the oiliness of the skin.

#### COMMENT ON AUTHOR'S SERIES

My study has taken me through all of my acne cases since 1930. I discarded from my list those patients that failed to report back for a sufficient period to be studied. My total survey comprised 480 cases. The cases eliminated because of incomplete or confusing factors brought the survey down to 255. Of these, 123 patients were treated by means other than the use of viosterol, and 132 on viosterol; 86 were treated with x-ray. The dietary instructions were identical in both series. The patients were instructed to eat plenty of green vegetables and lean meats, preferably rare, with fruits for dessert. The local applications were also identical, being lotio alba or the similar paste-like cream. In a few instances other factors, such as iron or hydrochloric acid, were added because of an existing anemia or digestive disturbance. Of those receiving viosterol the dosage was started at twenty drops each morning. Of these, in many patients the dosage was later increased to forty drops. Eighty drops a day were used on two patients. The reason for the morning dose was to take advantage of the influence of sunlight on the synthesis of vitamin D in the skin.

By testing, I found that the average dropper delivers about thirty drops to a cubic centimeter. The patient received twenty to forty drops daily, a few receiving eighty. The dosage averaged probably 5,000 to 14,000 units at a dose. Those on the higher dosage may have healed more promptly in a few instances.

It is unfortunate that on starting the use of viosterol I did not expect the good results I later observed. I, therefore, have had to rely on a tabulation made from my remarks on each patient's history. I believe, however, that, if anything, they belittle the actual results, as my satisfaction with the procedure has been complete.

I am not going to present this long series of cases because the tabulation would be boresome to you. If any of you are interested in surveying the charts, they are available. The following data were kept on all these cases: age, duration, sex, menstruation, constipation, physiological factors, local treatment, general treatment, dosage of viosterol, x-ray treatment, observation at one month, observation at three months, total observation, and final remarks. Specimen tabulation is seen on this slide. The results of this tabulation are as follows:

TABLE 1.—Patients Treated With X-Ray Without Viosterol

Not noted one month.....	12		
Unimproved at one month.....	45		
Better at one month.....	29		
Unimproved at three months.....	17	20%	
Better in three months.....	30	35%	
Much better in three months.....	13	15%	15%
Healed at three months.....	26	33%	33%
Satisfactory in three months.....			48%
Healed, final note.....	56	63%	
Relapsed.....	21	25%	
Unsatisfactory throughout.....	20	23.3%	
Total number of cases treated with x-ray.....			86

TABLE 2.—*Patients Treated With Viosterol*

Not noted one month.....	0		
Unimproved at one month.....	6		
Better at one month.....	87		
Much better at one month.....	38		
Healed at one month.....	1		
Total cases viewed at one month.....	132		
Unimproved at three months.....	10	14.2%	
Better at three months.....	8	10.2%	
Much better at three months.....	20	28.5%	28.5%
Healed at three months.....	32	47.1%	47.1%
Satisfactory in three months.....			75.6%
Total viewed at three months.....	70		
Unfavorable on viosterol.....	2		
Viosterol cases requiring x-ray.....	3		
X-ray advised at the first visit			
found to be not necessary later..	9		
Relapsed .....	1		

It is interesting to note in this series that 100 per cent more patients failed to return after one visit, when x-ray was advised, than when viosterol was prescribed. It will also be noted that I have made a direct comparison only with cases treated with x-ray; the only difference in treatment in this series being through the use of x-ray in one series, and viosterol in the other. Although the number of cases surveyed was considerably greater than those shown, the elimination of the non-x-ray cases has brought the total down to 204.

## SUMMARY

I believe I may say that at no time in my dermatological experience have I felt such complete satisfaction with a treatment as I have with the cases of this series. I know that vitamin D is an imperfect weapon to slay this disfiguring disease, but it undoubtedly gives one a feeling of being well defended. From the patients' viewpoint, it has left little to be desired, as they find themselves improving, both in appearance and in general well-being. Many have expressed the sentiment, "Never felt better."

## IN CONCLUSION

Briefly, I wish to mention some fortunate side-observations in patients presenting other skin diseases. Two cases of localized scleroderma healed completely. Three patients with alopecia areata grew their hair without other treatment. Psoriasis gave me the impression of improving more rapidly. One patient, a generalized exfoliative case of this disease shown to the San Francisco Dermatological Society at the height of eruption, has stayed well without a spot for a year. One case of old x-ray atrophy improved 100 per cent, and one severe pernio was similarly relieved. Three out of four cases of granuloma annulare healed completely.

I recognize that there is much that is intangible in this paper, as personal impressions are apt to be erroneous if enthusiasm is a persuading factor. I have, therefore, examined very critically those cases that were seen before viosterol was being regularly prescribed, and was given only where a "tonic" was considered to be good "policy." The results in these instances were the cause of my future enthusiasm. I have also recorded, in many

instances, the enthusiasm of the patients, especially in letters received later. The percentage of cures and marked improvement is still low. Perhaps the dosage is not optimal, or that large doses of calcium should also be used. The other vitamins may further add to success. The wrong tree may have been chosen to bay around and another factor of greater importance missed. I believe that all these things are to be weighed, and that time and usage will bring this out. It is my intention to attack these problems in turn, and hope to report again when a sufficient number of cases have accumulated.

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## DISCUSSION

GEORGE V. KULCHAR, M.D. (450 Sutter Street, San Francisco).—The well-controlled series reported by Doctor Maynard suggests that large doses of vitamin D are more effective in the treatment of acne than x-ray. The percentage of satisfactory results, both immediate and permanent, secured with roentgen therapy in his series is considerably less than that usually obtained, and may be due to the most severe cases requiring x-ray therapy. Most observers report from 80 to 95 per cent of satisfactory results with roentgen therapy (McKee, Andrews), and less than 10 per cent of relapses. Unsatisfactory results, including relapses, are due usually to inadequate dosage. By careful preliminary testing, adjustment of dosage, and watching for early evidences of reaction, x-ray therapy in most instances can be carried out to 1200-1500 R doses without injury to the skin. It remains our most effective treatment for acne.

The acne form dermatoses result from a disturbance of the pilosebaceous apparatus. This may be due to external irritation from oils, tars, or gases, or hematogenously by allergens, products of the tubercle bacillus, or the halogens. Their effect on patients with acne vulgaris is well known. It is reasonable to suppose, as Sulzberger and others have suggested, that some hormonal stimulation of the pilosebaceous apparatus, resulting in the comedone formation, is an important factor in the genesis of acne. The persistence of activity in the sebaceous gland, an invagination of the epidermis, with the secondary invasion of bacteria, results in the acne lesion. Similar keratinizing metaplasia in the pilosebaceous apparatus has been reported by Lowenthal and by Frazier, and Hu in vitamin A deficiency, with the production of comedones over the face, and in numerous instances acne which disappeared on restoring the vitamin A content of the diet to normal. The histological similarity of the lesions reported by these observers to the involuting acne lesion is striking.

Because of this I have used vitamin A in 55,000 unit doses daily, in addition to amounts of D equivalent to those used by Doctor Maynard. My patients have not been so well controlled and many received x-ray therapy in addition. Aside from the "tonic" effects, I have been impressed with its value. However, the percentage of satisfactory results in patients not receiving x-ray have been considerably less.

The combination of vitamin A with D may have the advantage, as suggested by the laboratory studies of Gross-Selbeck, of decreasing the toxicity of the latter.

It is only through such well-controlled and extensive studies as Doctor Maynard has made that effectiveness of

vitamin therapy in management of acne, where so many factors are involved, can be determined eventually.

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HENRY J. TEMPLETON, M.D. (3115 Webster Street, Oakland).—Several years ago I treated a few cases of acne by means of viosterol. Because of failure to note improvement, I abandoned the treatment. I must state, however, that I kept no careful records of my results and that I did not control the experiment. Moreover, my dosage was five to ten drops a day, which may have been inadequate.

Having heard Doctor Maynard's interesting results dealing with a large series of cases, and feeling the need of something to supplement the one remedy that I believe is of definite value, namely, x-ray, I will resume viosterol therapy in selected cases.

As Doctor Maynard has stated, any favorable action of viosterol on acne might well be due to its influence upon the calcium metabolism. We can recall that calcium has been claimed to have been of value in acne when given intravenously. The well-recognized fact that sun baths are of value in acne may be due to their synthesis of viosterol in the skin. What relationship this bears to the pigment-producing mechanism of the skin, I do not know; but it is my experience that the value of sun bathing and ultra-violet light therapy (excluding cases treated by heavy exfoliating doses) is directly proportional to the amount of tanning produced. Acne in the blond patient who freckles and peels but who cannot be tanned, does not respond as well as in the brunette. I should like to ask Doctor Maynard as to whether or not he has noted any difference in results in blond or brunette patients with viosterol?

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NELSON PAUL ANDERSON, M.D. (2007 Wilshire Boulevard, Los Angeles).—Doctor Maynard has given us the result of his experience in the therapy of acne vulgaris with vitamin D. This line of therapy should especially appeal to the physician who is continually requested by acne patients to prescribe some general tonic or blood medicine. It would seem advisable, however, to remember that, from a scientific standpoint, the most satisfactory results in medical treatment are those developed for conditions whose etiology is known. In other words, all rational therapeutics is based upon cause. Our knowledge of the etiologic background of acne certainly leaves much to be desired. Personally, I feel that the true etiology of acne has an endocrine basis, but am perfectly frank to admit that at present all treatment of this nature has been unsatisfactory. It may well be that vitamin D, in its regulation of calcium and phosphorous metabolism, also effects changes in the endocrine glands, and that these functional changes in turn act upon the sebaceous glands which are involved in acne vulgaris. The fact that vitamin D apparently benefits acne vulgaris is to me of much less importance than the question of how it produces its benefits.

## TRAUMA AND MALIGNANCY\*

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**A**BELIEF that malignant disease may result from trauma is so prevalent that approximately 100 per cent of the laity and most of the profession have come to look upon trauma as a causative factor. Not many years ago not only the ignorant, but the majority of the more intelligent classes accepted without question trauma on the head in infancy as the cause of insanity. Today trauma as a causative factor in malignant disease is accepted without question, and the doctor is "on the spot" indeed if he is so careless as to express an opinion

to the contrary. In taking histories on patients with malignant disease, invariably the patient volunteers the information regarding the trauma which caused the disease. Occasionally, when the patient is unable to remember a particular trauma, he apologizes for being so ignorant and unobserving. Where these ideas come from it is not altogether clear, but they must originate, in part at least, from the rather loose teachings of former years, and court decisions too often based upon the rather glib testimony of members of our profession. Of more recent years the profession itself, in the more scientific circles, have come to the realization that there may not be such a close relationship, and has learned to approach the subject with an open mind. The courts also have become awakened to the situation, and have accepted certain rules and regulations laid down by the students of pathology of tumors.

## CAUSATIVE FACTORS OF MALIGNANT DISEASE

A study of this problem leads one immediately to the consideration of the causative factors of malignant disease. There are many interesting theories, the most popular, today, being that there is a loss of control or balance among the cells of the body. This loss of control might be a change in the particular cell which enables it to escape from under inhibiting influences which normally keeps it in place, or it may be the loss of the inhibiting properties of cells which maintain control, thus allowing a cell with normal growing tendencies to proceed to develop without any inhibitions at all. Granting that one or the other of these theories is correct, we are then led to the consideration of how this comes about. Investigations in this direction have favored a general acceptance of the theory that there is a change in the physiology of the body, probably chemical, which makes an individual susceptible to the development of malignancy, or there is the existence congenitally to some unbalance in the physiology of the body. But this does not explain why a malignancy should develop at any one particular place. To answer this question, one must seek for some strictly localizing determining factor, or tissue disturber. Trauma being the commonest and an easily understood tissue disturber, one would naturally look upon injury to tissues as the most likely factor in determining the exact site of the malignant development. When one considers, however, the very great frequency of traumas, many of them violent in the extreme, and the relatively infrequent instances of malignancies, one must approach the subject with only the greatest of misgivings, and with the mental admonition to exert extreme caution lest one be led astray.

## SINGLE DIRECT VIOLENCE AND MALIGNANT DISEASE

The relationship of the single direct violence with the development of malignant disease for many years was admitted, but in recent times, beginning with the critical analysis of James Ewing and his about-face, the pendulum has swung to the other extreme, and students of this subject are of

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